Benefits of Lean Management in Liquid Waste Operations - One Company's Journey – 15402

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ABSTRACT

For Savannah River Remediation, LLC (SRR), Lean Management is the culmination of a number of years of searching for an effective process improvement methodology. SRR formally applies Lean Management as the cornerstone to transforming the way we work and lead.

Two foundational principles support all Lean efforts: respect for people and continuous process improvement. Respect for people means we respect the work they do and the knowledge they have attained. Continuous process improvement focuses on <u>continuous </u>because to be successful we must continuously return to the process to refine, improve, and optimize.

Like every other US DOE contractor, SRR is faced with challenges to accomplish more with less. Our initial round of Lean events focused on value streams such as Work Planning and Control, Supply Chain, and Tank Closure acceleration. We have completed a first pass through these programs. As a result, in general terms, process times were cut in half, while reducing rework and quality issues significantly. SRR reduced Corrective Maintenance backlogs without any appreciable increase in the workforce.

This paper chronicles our search for improvement, what we did right, what we did wrong, and where we go next. In short, we want to challenge the management, contractors, and employees in US DOE complex to take this journey. The work we do is vitally important to our nation, our families, and our future. We owe it to the US DOE mission to do all we can with entrusted facilities, personnel, and taxpayer dollars.

INTRODUCTION

Like many programs in the US DOE Complex, in 2013 SRR was faced with budget constraints driving workforce reductions, life extensions to aging infrastructure, and knowledge loss associated with retirements. All of these variables could produce lost productivity, disengagement of the workforce, and low morale. We had to better utilize employee intellect and not just their physical abilities. The decision was made to fundamentally change the way we work and conduct the business.

The SRR approach to Lean philosophy was based on Sellafield experience. The approach procured the Simpler Business System® which provides the training and coaching necessary for a lean journey. The advantage of the business system approach over the "lean as a tool" approach involves the use of seasoned and experienced Sensei (master coaches) who have experience transforming corporate cultures to lean thinking and action. The implementation of

the Simpler Business System® at SRR is called "Mission Excellence".

The Lean philosophy focuses on creating value for the customer. Any action or process that a customer would be willing to pay for is considered to add value. Any action or process that the customer is not willing to pay for is considered non-value added and wasteful. Essentially, lean is centered on making obvious what adds value by reducing the non-value added components. A Lean approach addresses the following goals at a minimum:

Improve quality: To stay competitive in today's marketplace, a company must understand its customers' wants and needs and design processes to meet their expectations and requirements. In the nuclear industry quality is not just the first priority it is the deliverable.

Eliminate waste: Waste is any activity that consumes time, resources, or space but does not add any value to the product or service. Typically waste in a company can fall into one of eight categories defined as follows: Transportation (moving products that are not actually required to perform the processing), Inventory (all components, work in process, and finished product not being processed), Motion (people or equipment moving or walking more than is required to perform the processing). Waiting (waiting for the next production step, interruptions of production during shift change), Overproduction (production ahead of demand), Over Processing (resulting from poor tool or product design creating activity), Rework (the effort involved in inspecting for and fixing defective products, papers, etc.) and Intellect (underutilizing the knowledge of the worker about job area)

Reduce time: Reducing the time it takes to finish an activity from start to finish is one of the most effective ways to eliminate waste and lower costs. One way this can be seen is as a "touch time" or direct labor savings. This is when the actual time spent working on an action or process is reduced freeing up the person to do other actions. It can also be seen as a cycle time reduction or indirect labor savings. This would be a shortening of the duration of a step or process but lessening the actual work performed during the entire cycle.

Reduce total costs: To minimize cost, a company must align production to meet the customer needs. Overproduction increases a company's inventory costs because of storage needs. Many times a small amount of working inventory is required to minimize downtime but too often this philosophy is used to store and or make more spares than are really needed to complete work.

DISCUSSION

Lean Implementation at SRR

The SRR journey towards Lean was initiated by conducting a Transformation Plan of Care (TPOC). The TPOC event pulled together the top management level of the company who spent a week defining the key processes that would provide value to DOE and meet the contract deliverables. These processes were recognized as the value streams of the company and were evaluated in events known as Value Stream Analyses (VSAs). The VSA determined sub-

processes where Rapid Improvement Events (RIEs) could improve work tasks within the value stream. Figure 1 depicts the relationships among Lean elements.

To provide structure to the overall transformation management, various conference rooms were designated throughout SRR as Mission Control Centers (MCCs).   An MCC is a designated location where the appropriate teams assemble and track their metrics, discuss actions for closure, create countermeasures when needed, and celebrate successes on a regular basis.

Fig. 1: Lean Relationships and Metrics

The MCCs also communicate to the workforce progress on the transformation effort. The decision was made to have an Executive level MCC and an MCC for each value stream in the corresponding work area.

During the TPOC event, governing in the form of True North metrics was established to represent how well the company was operating. Aggressive target values for these metrics were chosen and the gaps between the current state and the new chosen target state were identified. These gaps were affinitized and solutions to eliminate the gaps were chosen. These solutions were placed into 3 categories: Just Do/Stop Its, Lean Projects, and Value Stream Analysis (VSA) areas. The Just Do/Stop Its are items that can be completed relatively easily. Lean Projects are improvements that require a focused individual or team to address them over a few weeks and/or months. The VSAs are process areas that where improvement is needed to impact SRR's true north metrics.   Waste elimination and/or production improvement in these areas are deemed vital to achieving the target state. The selected VSAs for SRR journey were Work Planning and Control, Supply Chain, and Waste Removal and Tank Closure (WR&TC).

In December 2013 the Work Planning and Control VSA was completed. Next came the Supply Chain VSA in February 2014 followed by the WR&TC VSA one month later. Several Just Do/Stop Its, and Projects have been completed since then. Each VSA group has also completed several Rapid Improvement Events (RIEs). These RIEs consist of getting a group of Subject Matter Experts together with their customer(s) and/or supplier(s) along with one or two people with an outside perspective of the process. The RIE team approach consisted of group meetings to initially confirm the current state, set a target to work for improving the work process, and identify gaps for reaching the target.

Then the RIE team split into smaller groups to address a selected problem. Once the team had a potential solution(s) to the problem, rapid experiments were conducted to test the validity of their proposed solution(s). The findings were submitted to the team for adoption. If adopted, the potential benefits were determined and, if necessary, action steps were written to follow-up and ensure implementation of the solution(s).   Out-briefs were given to Senior Management to bring
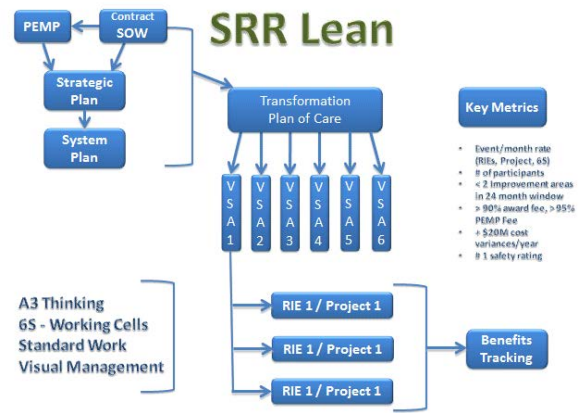
awareness to the upcoming change and answer any questions they may have. Each VSA event typically spawns several RIE events that are conducted one per month. Figure 2 shows a typical RIE current state map developed by a Lean Team.

Fig 2: Typical Current State Map

As SRR began the journey, it became evident that the workforce was not being engaged in the improvement process as rapidly as desired. To increase the rate of employee engagement, SRR began to complete both 6S projects and Cross Cutting RIEs specifically focused in areas that have been highlighted as "sore spots" within the workforce. Utilizing the intellect of the workforce was paramount to SRR success. 6S projects and Cross Cutting RIEs allowed engaging the workforce at the worker level and helped reduce waste from daily activities. In addition, this approach was shown to consistently improve overall morale and productivity while reducing safety issues.

The focus of 6S projects was to survey a given physical work area, map out the processes in that work area, and identify the tools used to complete the work prior to identifying and removing unnecessary things in the work area. The team sorted (Seiri) needed items and placed them in the order (Seiton) of the work being done. A regular cleaning process (Seiso) was defined by the team. The work area tools, parts, work flow, labeling, and instructions were standardized (Seiketsu) and become the new way of life (Sitsuke) which is now referred to as standard work. SRR added a sixth English word, 'Safety', because safety is always the most important part of our mission at SRR. So, in summary, the 6S approach allows workers to organize and place value based tools while minimizing the waste. Standardizing the work keeps the waste from reappearing. Figure 3 shows the results of one application of 6S.

Fig. 3 Before and After 6S

Cross Cutting RIEs are simply rapid improvement events in areas that are in need of improvement and they touch on many people of our organization yet they are not tied to any established VSA. These events are run exactly as an RIE determined from a VSA. The only difference is that it often requires a little more work to complete the preparations for an event.

Obstacles Encountered during the Lean Journey

RIE workscope: Rapid Improvement Event scopes were too large initially, due to the extreme complexity of many SRR. This resulted in fewer completed items and many open actions which created a burden on the participants after the event was over as the open actions required constant tracking and updates. RIEs with smaller workscopes resulted in rapidly achieving the needed changes, and allowed the participants to see improvements immediately.

Workforce engagement: After two or three RIEs from a specific event were completed it became evident that too many of the previous participants were being chosen again. Too many of the same attendees slowed propagation of the culture change, as well as, overburdened the attendees in completing the action items from events. The VSA steering team realized that the RIE events must be evenly distributed amongst the workforce in order to spread the knowledge over a broader area and engage more of the workforce.

Roles and responsibilities: The roles and responsibilities of the Executive Steering Teams, Value Steering Teams, Process Owners, Facilitators, and Participants were not clearly defined initially. Although this was discussed in general it was not fully established in the beginning of SRR Lean implementation. This resulted in gaps and confusion between various parties and a lack of ownership in key areas.

Functioning MCCs: Creating functioning MCCs that give an appropriate amount of detail without an over-bearing administrative burden has been a challenge. Once the MCCs are established it often takes a few review meetings before the meeting becomes productive and efficient. Also, determining which and how many key metrics to display can be difficult.

Metrics: Proper True North Metrics are key to seeing the impact lean events are having on the

organization. The original True North Metrics proved to be inadequate for SRR. In October 2014 a decision was made to change and adopt new ones that would clearly show the progress in the Lean journey. Properly quantifying the potential benefits from solutions and/or events has been difficult at times. The benefits measure was not considered until several months into Lean implementation. It is important to establish the benefits measure in the beginning for properly aligning the resources and realizing benefits including cost savings. In order to address this issue, a cross cutting RIE on benefits tracking was performed to improve the process and provide a tool for collecting and utilizing the data.

CONCLUSIONS

Although SRR is just getting started in the Lean journey, tremendous transformation is visible. It is clear that Lean thinking is logical and common sense. The Lean process helps to eliminate tasks that are unimportant while focusing on value. More importantly the workforce ability, knowledge, and creativity is utilized by engaging the workforce at all levels to create a better product, quicker and cheaper, without sacrificing quality or safety. True implementation of Lean requires a drastic change to culture and established ways of doing business. Change is never easy but often necessary to adapt and thrive. SRR has chosen Lean not because it is an easy change but because it is a necessary one for properly utilizing the workforce at the highest level of proficiency.